

<b>Title:</b> Math Element Card		
<b>Grade:</b> 3		
<b>PA Core Standard:</b> CC.2.2.3.A.4 Solve problems involving the four operations, and identify and explain patterns in arithmetic.		
<b>PA Connector:</b>		Identify multiplication patterns in a real world setting
<b>Strand:</b> Algebraic Concepts		<b>Family:</b> Describing and Extending Patterns
<b>Progress Indicator:</b> <i>E.PRF.2d representing and analyzing patterns and rules (e.g. doubling, adding 3) using words, tables, graphs, and models</i>		
<b>Big Idea(s):</b> Patterns exhibit relationships that can be extended, described, and generalized.		
<b>Essential Question(s):</b> How can patterns be used to describe relationships in mathematical situations? How can recognizing repetition or regularity assist in solving problems more efficiently?		
<b>Foundational Knowledge:</b> <ul style="list-style-type: none"><li>Recognize/identify an AB pattern as a pattern that has the same pattern over and over and never changing using colors, shapes, symbols or objects</li><li>Match a pattern using symbols or objects to represent a provided growing multiplication pattern in a real world setting</li><li>Recognize patterns and use words to describe the patterns they see</li></ul>		
<b>Key Vocabulary, Concepts and Symbols:</b> <ul style="list-style-type: none"><li>Understand concepts and vocabulary: <b>growing pattern, multiplication, level, increasing/increases, decreasing/decreases, objects or shapes</b></li></ul>		
<b>Suggested Instructional Strategies:</b> <ul style="list-style-type: none"><li>Multiple Exemplar Training or Example/Non-Example Training<ul style="list-style-type: none"><li>Growing Pattern: “Here is a growing pattern. Here is a growing pattern. Here is growing pattern. This not a growing pattern. Show me a growing pattern.”</li></ul></li><li>Ask students to determine if a rule exists for a provided pattern. (A pattern follows a predictable sequence OR There is no predictable sequence in this example, i.e., No rule can be stated.)</li><li>Model, Lead, Test<ul style="list-style-type: none"><li>Teach/model a growing addition patterns using 2D shapes or 3D objects as a pattern that increases by the same number in each row of the pattern (e.g., a pattern that grows by +2 would have 1 in the first row, 3 in the second row, 5 in the third row, and 7 in the fourth row)</li><li>Teach/model a growing multiplication problem using pictures (1 flower, 2 bees; 2 flowers : 4 bees; 3 flowers : 6 bees)</li></ul></li><li>Task Analysis (Backward Chaining)<ul style="list-style-type: none"><li>Provide the first three rows of a growing addition pattern and ask the student to create the fourth row</li><li>Using a T-Chart, provide the first three parts of the growing pattern and ask the student to create the fourth part of the pattern</li></ul></li></ul>		
<b>Supports and Scaffolds:</b> <ul style="list-style-type: none"><li>Examples of repeating patterns in real-world setting (e.g., in the environment and art)</li><li>T-Charts for growing patterns</li><li>Use of graphic organizers to illustrate a pattern of sets in which the student places 2D or 3D shapes or colors using addition or multiplication, e.g., X3 growing pattern (□ □ □) (□ □ □) (□ □ □) (□ □ □) (□ □ □) (□ □ □)</li><li>Counters</li><li>2D and 3D shapes, objects or pictures</li><li>Interactive whiteboard or other technology to model growing patterns</li></ul>		

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